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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,404	05/26/2006	Richard P Wood	SMBZ 2 01036	2871
27885	7590	10/06/2008		
FAY SHARPE LLP 1100 SUPERIOR AVENUE, SEVENTH FLOOR CLEVELAND, OH 44114			EXAMINER WALFORD, NATALIE K	
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			2879	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/534,404

**Applicant(s)**

WOOD ET AL.

**Examiner**

NATALIE K. WALFORD

**Art Unit**

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 May 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-15 and 17-20 is/are rejected.  
7) ☒ Claim(s) 16 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 10 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date 5/05  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

#### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Claim Objections***

Claim 7 is objected to because of the following informalities:

Regarding claim 7, claim 7 should read "at least one layer of A1" not "at least one layer of A1".

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 7-12, 15, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones (US 5,920,080).

Regarding claim 1, Jones discloses an electroluminescent device in figure 4, comprising a semi-reflecting structure (item 200), a reflecting structure (item 251), and a plurality of intermediate layers (items 300, 203, or 253) for light generation, wherein said Semi-reflecting structure thickness is chosen to cause destructive optical interference of ambient light reflected

thereby (column 3, lines 31-39), and said intermediate layers have thicknesses chosen to create a microcavity (item 400) for causing constructive optical interference of light generated therein and approximately 360° phase change of transmitted ambient light passing therethrough from said semi-reflecting structure and reflecting off said reflecting structure (see FIG. 4), such that said transmitted ambient light is subjected to further destructive optical interference within said semi-reflecting structure (see FIG. 4).

Regarding claim 2, Jones discloses the electroluminescent device of claim 1, wherein said intermediate layers include a hole-carrier layer and electron-carrier layer with a light generating region at the interface therebetween (column 6, lines 9-20).

Regarding claim 7, Jones discloses the electroluminescent device of claim 1, wherein said semi-reflecting structure comprises at least one layer of Al, SiO<sub>2</sub> and Cr (column 8, lines 23-26).

Regarding claim 8, Jones discloses the electroluminescent device of claim 1, wherein said reflecting structure comprises a layer of Al (column 8, lines 23-26).

Regarding claim 9, Jones discloses the electroluminescent device of claim 1, wherein said reflecting structure is deposited on a substrate (item 100) so as to form a top emission device (see FIG. 4).

Regarding claim 10, Jones discloses the electroluminescent device of claim 1, wherein said semi-reflecting structure is deposited on a transparent substrate (item 100) so as to form a bottom emission device (see FIG. 4).

Regarding claim 11, Jones discloses the electroluminescent device of claim 10, wherein said substrate is one of either clear plastic or glass (column 7, lines 21-26).

Regarding claim 12, Jones discloses the electroluminescent device of claim 1, wherein said intermediate layers include one of either light emitting polymers or inorganic light emitting materials (item 300).

Regarding claim 15, Jones discloses the electroluminescent device of claim 1, wherein said intermediate layers are selected such that the 360° phase change extends over the visible light range (see FIG. 4).

Regarding claim 17, Jones discloses the electroluminescent device of any of claim 7, wherein said reflecting structure is deposited on a substrate (item 100) so as to form a top emission device (see FIG. 4).

Regarding claim 18, Jones discloses the electroluminescent device of any of claim 7, wherein said semi-reflecting structure is deposited on a transparent substrate (item 100) so as to form a bottom emission device (see FIG. 4).

Regarding claim 19, Jones discloses the electroluminescent device of any of claim 8, wherein said reflecting structure is deposited on a substrate (item 100) so as to form a top emission device (see FIG. 4).

Regarding claim 20, Jones discloses the electroluminescent device of any of claim 8, wherein said semi-reflecting structure is deposited on a transparent substrate (item 100) so as to form a bottom emission device (see FIG. 4).

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 5,920,080) in view of Lin et al. (US PUB 2004/0086746).

Regarding claim 3, Jones discloses the electroluminescent device of claim 2, but does not expressly disclose that said hole-carrier layer comprises TPD and said electron-carrier layer comprises A1Q3, as claimed by Applicant. Lin is cited to show an electroluminescent device in figure 5 with a hole carrier layer (item 112) comprising TPD (paragraph 41) and an electron carrier layer (item 110) comprising A1Q3 (paragraph 42). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have said hole-carrier layer comprises TPD and said electron-carrier layer comprises A1Q3, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the purpose of using TPD as a hole carrier layer and A1Q3 as an electron carrier layer.

Regarding claim 4, the combined reference of Jones and Lin disclose the electroluminescent device of claim 3, wherein said intermediate layers include a buffer layer of CuPC (Jones; item 203) adjacent said TPD layer.

Regarding claim 5, the combined reference of Jones and Lin disclose the electroluminescent device of claim 4, wherein said intermediate layers include a conductive layer of ITO (Jones; item 202) adjacent said CuPC layers.

Regarding claim 6, the combined reference of Jones and Lin disclose the electroluminescent device of claim 5, wherein said thicknesses of the intermediate layers are as

follows: AIQ3 = 200 to 800 Å (Lin; paragraph 43), TPD = 200 to 500 Å (Lin; paragraph 43), CuPC = 0 to 500 Å (Jones; column 9, lines 2-4), ITO = 0 to 2500 Å (Jones; column 8, lines 31-32).

Regarding claim 14, the combined reference of Jones and Lin disclose the electroluminescent device of claim 6, wherein said thicknesses of the intermediate layers are as follows: AIQ3 = 600 Å (Lin; paragraph 43), TPD = 450 Å (Lin; paragraph 43), CuPC = 250 Å (Jones; column 9, lines 2-4), ITO = 1200 Å (Jones; column 8, lines 31-32).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones (US 5,920,080).

Regarding claim 13, Jones discloses the electroluminescent device of claim 7, wherein said semi-reflecting structure comprises AlSiO (column 10, lines 9-13), SiO<sub>2</sub> (column 10, lines 9-13), and aluminum (column 10, lines 9-13), but does not expressly disclose that AlSiO has a ratio of 3:2 and 5.5nm thickness, SiO<sub>2</sub> has a 60 nm thickness, and aluminum has a 10 nm thickness, as claimed by Applicant. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have AlSiO has a ratio of 3:2 and 5.5nm thickness, SiO<sub>2</sub> has a 60 nm thickness, and aluminum has a 10 nm thickness, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

*Allowable Subject Matter*

Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 16, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 16, specifically for the limitation of the layers are selected to have a refractive index that increases with wavelength in combination with other claimed features of the present claimed invention.

#### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalie K. Walford whose telephone number is (571)-272-6012. The examiner can normally be reached on Monday-Friday, 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571)-272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

nkW  
/Natalie K Walford/  
Examiner, Art Unit 2879

/Sikha Roy/  
Primary Examiner, Art Unit 2879